

WHAT IS CLAIMED IS:

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1. An integrated circuit package, comprising:
a substrate having a center region and a peripheral region;
5 a semiconductor die positioned on the center region of the substrate, the
semiconductor die having a bond pad;
a lead finger mounting ring positioned on the peripheral region of the
substrate;
a package lead attached to the lead finger mounting ring;
10 a bond wire with a first end portion coupled to the package lead and a second
end portion coupled to the bond pad;
an epoxy material forming a first encapsulation over the bond wire, the
semiconductor die, and a portion of the package lead; and
a mold compound forming a second encapsulation over the first encapsulation,
15 the lead finger mounting ring, the substrate, and a portion of the package lead.
2. The package of claim 1, wherein the first encapsulation limits movement of
the bond wire during formation of the second encapsulation.
- 20 3. The package of claim 1, further comprising a die attachment pad that is
attached between the semiconductor die and the substrate.
4. The package of claim 1, wherein the lead finger mounting ring comprises non-
conductive material.
- 25 5. The package of claim 1, wherein the first protective encapsulation comprises a
rounded top surface.
6. An integrated circuit package, comprising:
30 a substrate having a center region and a peripheral region;
a die attachment pad disposed on the center region of the substrate;

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a semiconductor die positioned on the die attachment pad, the semiconductor die comprising a plurality of bond pads;

a non-conductive lead finger mounting ring positioned on the peripheral region of the substrate;

5 a plurality of package leads attached to the lead finger mounting ring;

a plurality of bond wires with first end portions coupled to the package leads and second end portions coupled to the bond pads;

an epoxy material forming a first encapsulation over the bond wires, the first encapsulation having a rounded top surface; and

10 a mold compound forming a second encapsulation over the first encapsulation, the lead finger mounting ring, and the substrate, wherein the first encapsulation limits movement of the bond wires during formation of the second encapsulation.

7. The package of claim 6, wherein a pad pitch between two of the bond pads is under 60 μm .

8. The package of claim 7, wherein a length of at least one of the bond wires is at least 3500 μm .

9. The package of claim 8, wherein a wire diameter of the at least one bone wire is under 25 μm .

10. A process for forming an integrated circuit package, comprising:
providing a substrate having a center region and a peripheral region;
attaching a lead finger mounting ring on the peripheral region of the substrate;
mounting package leads on the lead finger mounting ring;
positioning a semiconductor die on the center region of the substrate;
attaching bond wires to the package leads and to the semiconductor die;
limiting movement of the bond wires with an epoxy material;

after limiting movement of the bond wires, enclosing the substrate, the semiconductor die, the lead finger mounting ring, the bond wires, and the epoxy material in a mold compound.

- 5 11. The process of claim 10, wherein the limiting movement of the bond wires comprises:

dispensing the epoxy material over the bond wires and the semiconductor die,
the epoxy material forming a rounded surface to enclose the bond wires; and
curing the epoxy material.

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12. The method of claim 10, wherein the lead finger mounting ring comprises non-conductive material.

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13. A process for forming an integrated circuit package, comprising:
providing a substrate having a center region and a peripheral region;
attaching a lead finger mounting ring on the peripheral region of the substrate;
mounting package leads on the lead finger mounting ring;
positioning a semiconductor die on the center region of the substrate, the semiconductor die comprising a plurality of bond pads;
20 attaching bond wires to connect the package leads and the bond pads;
dispensing epoxy material over the bond wires;
curing the epoxy material to form a protective encapsulation for the bond wires; and

- 25 after curing the epoxy material, dispensing a mold compound over the substrate, the semiconductor die, the lead finger mounting ring, the bond wires, and the epoxy material to form the integrated circuit package.

14. The method of claim 13, wherein the lead finger mounting ring comprises non-conductive material.

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